

We claim:

1. An apparatus for sequential processing of a plurality of analytes, the apparatus comprising:
- 5 a flow chamber for disposing a population of microparticles in a planar array, each microparticle of a plurality of microparticles of the population having an analyte anchored thereto;
- fluidic means for sequentially delivering processing reagents from one or more reservoirs to the flow chamber so that the analytes anchored to the plurality of microparticles are sequentially
- 10 exposed to the processing reagents; and
- detection means for detecting a sequence of optical signals from each microparticle of the plurality, each optical signal of the sequence being indicative of an interaction between a processing reagent and the analyte anchored thereto.
- 15 2. The apparatus of claim 1 wherein said flow chamber has an axis and comprises in sequence along the axis an inlet, a planar cavity, a dam, and an outlet such that said processing reagents enter said flow chamber through the inlet and flow in the direction of the axis through the planar cavity and to the outlet.
- 20 3. The apparatus of claim 1 or 2 claim wherein said planar cavity of said flow chamber further has a optically transmissive ceiling and a floor, the optically transmissive ceiling and the floor being parallel to one another and the floor having a plurality of parallel ridges, the parallel ridges being disposed parallel to said axis of said flow chamber, and the parallel ridges being spaced so that said microparticles in said planar cavity form rows between the parallel ridges.
- 25 4. The apparatus of any preceding claim wherein said detection means further comprises an optical train for focusing an image of said optical signals from said planar array of said microparticles onto an electro-optic detector for generating a digital image of said optical signals, and recording means for recording a plurality of digital images of said planar array of said
- 30 microparticles.
5. The apparatus of claim 4 wherein said detection means further comprises signal tracking means for correlating said optical signals from each of said microparticles in each of said digital images to form for each said microparticle of said plurality a sequence of said optical signals.
- 35 6. The apparatus of claim 5 wherein said electro-optical detector is a CCD camera.
7. The apparatus of any preceding claim wherein said analyte is DNA and wherein said optical signal is a fluorescent signal.